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Property-Casualty Insurance Markets

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I. Introduction

In this paper we review recent financial trends and public policy issues affecting the property-casualty insurance industry.[1] We begin with an overview of the structure and financial condition of the industry. With the overview as background, we discuss economic and legal factors, both industry-wide and within individual lines, that raise public policy issues and prompt solvency concerns. We first look at the impact of the tort liability system on costs, describing the solvency and affordability concerns raised by accelerating insurance costs and non-market regulatory responses. We then examine the degree of competition in the industry, and consider whether the McCarran-Ferguson antitrust exemption affords a potential for collusion. Finally, we summarize performance issues in selected individual lines.

II. Overview of the Property-Casualty Industry

Property-casualty insurance protects individuals and commercial businesses against the risk associated with the loss to property from fire and other hazards, or loss deriving from liability for personal injury and damage to the property of others. There are approximately 3,900 companies selling some form of property and casualty insurance in the United States, with aggregate premium receipts of $218 billion and total industry assets of $556 billion in 1990.[2]

The property-casualty insurance sector includes a wide variety of different lines of insurance for both individuals and businesses. While companies previously tended to concentrate on single lines, many companies today are multiple-line insurers and many are also in some way affiliated with life and/or health insurance firms. Table 1 shows property-casualty premiums by line for 1980, 1985, and 1990 along with the growth rate over the 1980-90 period.

Personal insurance lines include private passenger automobile and homeowners multiple peril. Private passenger automobile covers both physical damage and liability resulting from accidents; it was the largest single line of insurance in 1990, accounting for 36 percent of premiums. Homeowners multiple peril offers a package of coverage for damage due to fire, windstorm, burglary and theft, and protection against liability claims.

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[1] A review of issues in the life-health insurance industry is described in Greenlees and Duggan (1992).

[2] Insurance Information Institute (1991).

Table 1
Property-Casualty Premiums
Selected Years

Line	Net Premiums Written ($Mil) 1980	1985	1990	Average Annual Premium Growth (%) 1980-90
Fire	3,209	4,218	4,456	3.34
Allied Lines	1,574	1,955	2,649	5.34
Farm Multiple Peril	555	770	981	5.86
Homeowners Multiple Peril	9,821	14,066	18,757	6.68
Commercial Multiple Peril	6,885	12,096	17,709	9.91
Ocean Marine	1,065	1,177	1,179	1.02
Inland Marine	2,291	3,672	4,529	7.05
Workers' Compensation	14,238	17,047	30,957	8.08
Other Liability	6,415	11,544	18,123	10.94
Medical Malpractice	1,275	2,769	4,015	12.15
Aircraft	171	508	396	8.76
Private Passenger Automobile	31,676	49,423	78,393	9.49
Commercial Automobile	7,476	11,909	16,975	8.55
Fidelity	360	588	899	9.58
Surety	887	2,264	1,874	7.77
Burglary	135	122	108	-2.21
Boiler	293	618	661	8.48
Reinsurance	3,171	5,680	7,622	9.17
All Property-Casualty	95,568	144,186	217,824	8.59

Source: A.M. Best (1991a).

Automobile is the largest commercial line, followed by workers' compensation, multiple peril, and general (other) liability. General liability insurance is available as a separate line for both personal and commercial coverage and offers protection against claims arising from injuries to others or damage to the property of others. Workers' compensation insurance

provides coverage for medical expenses and lost wages for employees injured on the job. Multiple peril protection, as its name implies, offers a package of protection against individual perils; its availability has substantially affected the demand for the more specific lines of insurance.

1. Asset and Liability Structure

Liabilities and Equity. Property-casualty insurers accumulate surplus and reserve funds from the excess of income inflows from all sources over underwriting outflows. The majority of their liabilities are reserves against losses and reserves for premiums collected but not earned. Loss reserves are based on estimates of liabilities on which claims have either been filed or are expected. The unearned premium reserve arises from the fact that premium income is collected in advance of an actual payout for protection. Since the full premium cannot be earned until the policy has expired, the unearned portion of a premium is held as a reserve to cover the cost of protection when a claim is filed. The net earnings from underwriting and investment gains represent additions to surplus.

Assets. The surplus and reserves are invested in assets consistent with the insurers' business risk, as determined by uncertainty in the size and timing of claims. Generally, property-casualty insurers experience a relatively short lapse of time between receipts of premium income and claims payments, so that asset accumulation is considerably less than that of life insurers. In addition, property and casualty claims are less easily predicted, so that the insurers need asset portfolios with a high degree of liquidity, yet with sufficient growth to cover claims far into the future. Consequently their portfolio goals include a considerable degree of marketability, safety of principal, and diversification, as well as growth. Because their investment income is generally taxed at the full corporate income tax rate, the portfolios usually contain substantial amounts of tax-exempt obligations and tax-favored equities.

The structure of the investment portfolio holdings has been relatively constant over the past 15 years. Fixed income obligations, including United States government securities, bonds of state and municipal governments, local authority special revenue bonds, and corporate bonds, have comprised about 75 percent of the investment portfolio over the decade of the 1980s. About 20 percent of the portfolio has been held in the form of common stocks over the same period.[3] Thus property-casualty investment portfolios are relatively "conservative"; sharp drops in financial markets should not pose exceptional risks to the industry.[4]

Some researchers have hypothesized that insurers increase the supply of insurance when interest rates rise in order to obtain funds to invest, a process known as cash-flow

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[3] Insurance Information Institute (1991).

[4] Kramer (1991a), Chapter 4, pages 41ff.

underwriting.[5] According to this hypothesis, the investment portfolio would constitute a separate "profit center" for the insurer and the portfolio choice would not be determined solely from the nature of the underwriting business. Under this hypothesis, the financial performance of the firm would depend on two factors and would not be expected to mirror closely the underwriting performance. This hypothesis is discussed further in the section on profit cycles below.

Like life and health insurers, property-casualty firms are organized as either stock companies, with limited stockholder liability for losses, or mutual companies, whose policyholders are liable for losses above the assets of the firm. While there are more mutual companies, stock companies comprise the bulk of the industry, in terms of both assets and premium volume.

2. Regulation

The regulation of property-casualty firms has been predicated on the assumption of significant market imperfections, such as the presence of "natural" monopoly or oligopoly powers, or imperfect information on the part of consumers regarding insurance products and the financial capability of insurers. Regulation to address these imperfections may be implemented through several approaches, all adopted in varying degrees by the individual states. The regulatory activities include controls over aspects of insurers' operations, particularly rate setting and investment choices; minimum capital and surplus requirements; supervision of the financial condition of insurers; and guaranty systems for paying portions of claims against insolvent insurers. All states have adopted specific minimum capital requirements for obtaining a license to sell insurance. If capital and surplus falls below the required minimum, the state insurance commissioner may liquidate the firm or prohibit it from selling new coverage. Additional policyholder protection is afforded by the individual state guaranty funds, which can reimburse policyholders of a company that has been declared insolvent by assessing solvent insurers based in the state. This mechanism spreads the costs of any insolvency across the industry. In addition, some states allow fund assessments to be credited against premium taxes, further spreading the insolvency costs across the taxpaying public.

Other regulatory initiatives have addressed such potential imperfections as consumers' disregard of externalities in their insurance decisions, the "moral hazard" of insurance which decreases the individual's incentive to avoid covered losses, and the inability of firms to make individual judgments regarding consumer risk which leads them to raise equity issues by using personal or location-based attributes to characterize risk. Such potential problems have inspired compulsory insurance, government regulation of product and workplace safety, joint underwriting pools and the passage of regulations governing what personal characteristics may be used by insurers to grant coverage.

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[5] See, e.g., Doherty and Khang (1988) and A. M. Best (1991b).

Historically, the states have used rate regulation to address solvency, access, and affordability issues. In the early 1900's, solvency and discrimination were the regulatory issues of greatest concern and the states addressed these concerns through anti-discrimination laws and minimum rate regulation. In the system of rate regulation in effect subsequent to passage in 1946 of the McCarran-Ferguson Act, as described by Joskow (1973), the states regulated in conjunction with industry-owned rating associations or bureaus. The rating bureaus filed jointly-made rates with state insurance commission, and members of the association were required to adhere to the bureau rates unless given prior approval for deviation. The regulatory authorities set administrative practices that discouraged deviations; for example, companies that desired to deviate could be opposed by the rating bureau during the rate approval process.

The influence of the rating bureaus began to decline by the early 1960s as developments such as the growth of direct writers led to decreased uniformity across firms and increased price competition. By 1971, when the Insurance Services Office (ISO), the largest rate advisory association for most property and casualty lines, was formed, members were not required to use its proposed rates.

At the same time, problems of affordability, brought on by increases in costs of certain lines, brought pressure on regulators to limit rate increases. These cost developments shifted the regulatory concern from assuring solvency towards that of maintaining affordability and access to these lines. Two dissimilar regulatory responses developed. In many states, regulators adopted competitive rating laws to enhance the degree of price competition. By the mid-1980s nearly half of the states had reduced the degree of regulation in most lines.[6]

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[6] Kunreuther, Kleindorfer, and Pauly (1983) list six types of pricing regulation in force in private passenger automobile insurance markets by the mid-1980s:

- state-made or mandatory bureau rates, in which the state agency or bureau sets the rate and all insurers must adhere;
- prior approval, in which rates must be filed with and approved by the authority before use;
- modified prior approval, in which the rate must be filed with and approved by the state authority except for certain circumstances;
- "file and use," in which the rates must be filed prior to use and the authority may subsequently disapprove the rates;
- "use and file," in which the rates must be filed after they have been placed into use;
- "no file," in which rates are not required to be filed with or approved by the rate regulatory authority.

Generally, the first three categories above are considered less competitive, while the last three are regarded as "open competition." However, state regulations vary within each type. In addition, statutory rate regulation may

In contrast to the states adopting competitive rating laws, a number of states — particularly those hard hit by substantial increases in the underwriting costs of the "universal availability" auto insurance and workers' compensation lines, which have a universal coverage requirement — moved toward more restrictive auto insurance regulation. The policies adopted by these states included establishing binding rate ceilings ("rate suppression"), intentionally delaying rate increases, and prohibiting rate-setting on certain potentially discriminatory bases. Kramer (1991b) observes that several states also re-regulated rates for some commercial lines following the swift rise in costs in the general liability line in the mid-1980s. For example, some states mandate rates or require prior approval of all rates (for example, Massachusetts, New Jersey and North Carolina), while other states do not regulate rates. [7]Grabowski *et al* (1989) comment that the 1988 referendum in California, in which the voters chose to impose insurance rate reductions, "may signal a return to a more aggressive regulatory era."

Changes in the regulation of workers compensation mirrored to some extent the two diverse trends in auto insurance, with several states adopting some form of competitive rating law during the 1980s, while the regulation in other states continued to pursue policies of rate suppression. Workers' compensation, however, generally remains subject to considerably more restriction than does auto insurance. Most states with prior approval regulation allow only limited deviations from bureau rates; in twelve states, the state provides insurance through "state funds" which compete with private insurers; in six states, insurance is provided exclusively through state fund monopolies.

3. Residual markets

In most states, insurers have the option of rejecting specific applicants when they conclude that the maximum allowable rates are inadequate to cover expected losses for such customers. To ameliorate access problems for these individuals in the auto liability and workers' compensation lines, for which universal availability is considered a necessity, states have established "residual markets". Individuals who cannot obtain (or afford) voluntary coverage from insurers are relegated to the residual market and shares of the market are (generally) allocated to insurers active in the state.

Because the rates in the residual markets are generally regulated in accordance with affordability goals, they do not generally cover the costs of the residual market insurance coverage. In states without restrictive rate regulation, the state regulator allows insurers to

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not actually be binding; insurance departments in several prior approval states have adopted *de facto* policies of open competition, and vice versa. See Kunreuther *et al* (1983) for further details.

[7] Currently, ISO characterizes the regulation in 32 states as prior approval, while 19 states use competitive rate regulation. The classification is somewhat arbitrary in that some states use different methods for different lines.

cover the costs of residual market coverage in the voluntary market for the same line. Consumer groups argue that the existence of the de facto subsidy implied by this practice is appropriate to reduce the high cost of auto insurance that otherwise constitutes a regressive "tax" upon low-income groups; similar equity arguments are made in the case of workers' compensation. These arguments ignore the fact that the presence of subsidization will reduce the individual's incentive to exercise care while engaging in the insured activity. Because of the distortions introduced by subsidization, the size of such a "market of last resort" should remain a small proportion of the total market size. Significant growth in residual markets reflects market dislocations.

The sharp increases in insurance costs in recent years have provided incentives for increases in residual markets. In states with competitive rating regulation, insurers have attempted to pass on costs to the voluntary markets, causing many individuals to either enter the residual markets or self-insure. In states which have attempted to suppress the response of premiums to costs, the insurers, seeking to reduce business costs, have attempted to limit business to only the highest quality insureds or to withdraw from the voluntary markets, forcing many individuals into the residual markets. The residual market dislocations are discussed in more detail below.

III. Financial Performance and Public Policy

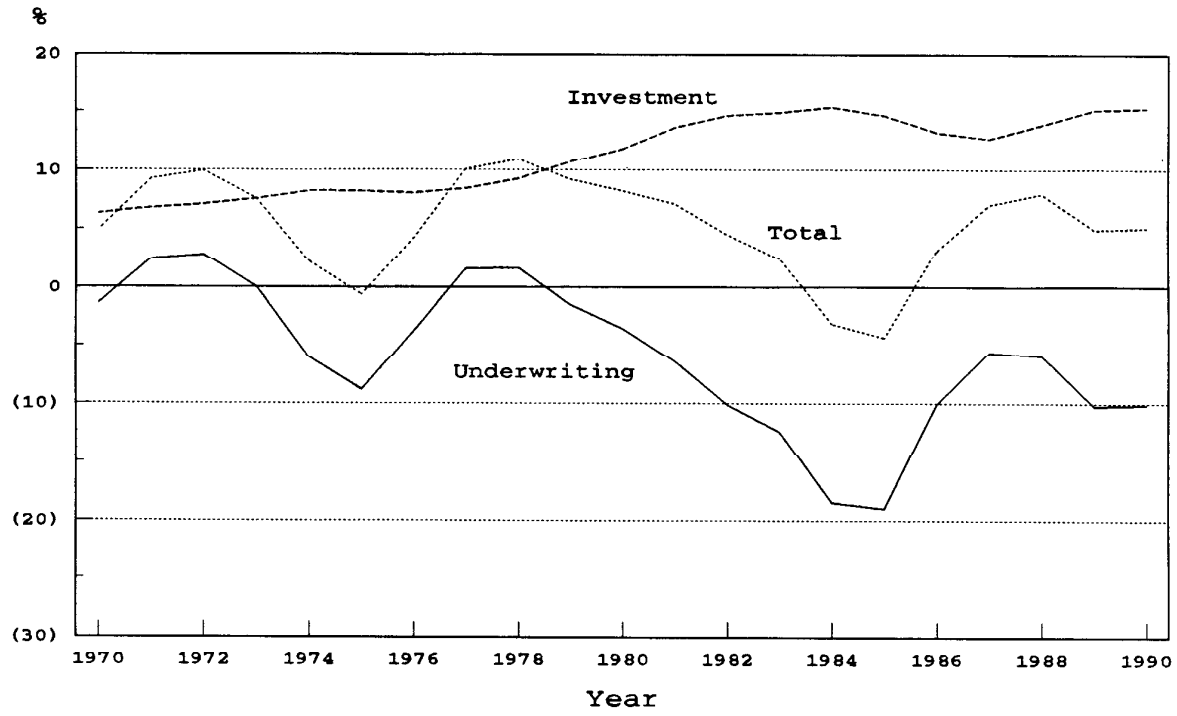
1. Financial Condition and Performance

This section describes recent financial performance of the property-casualty industry. The emphasis of this description and the following discussion is on identification of performance trends, both in the aggregate and across lines. The statistics used for the analysis are not sufficient to support any substantive conclusions regarding the potential for insolvency; analysis of the potential for insolvencies requires detailed data on individual firms. As a consequence the section only identifies issues which may form the basis for further study.

The income of insurance companies is derived from two primary sources: underwriting income from premiums net of claim costs and expenses, and income from the investment of premiums. Figure 1 displays industry net underwriting income, investment, and total net income as a percent of net premiums earned. Net underwriting income is gross underwriting income less policyholder dividends; total net income is the sum of the underwriting and investment components. The chart clearly indicates the different patterns of underwriting and investment income. The chart also depicts the apparently cyclical pattern of total profits in the industry and its relation to underwriting performance.

The experiences of individual property-casualty insurance lines, while different in degree, reflect the industry pattern. Table 2 presents ratios to premium income of combined losses

Figure 1
Components of Property-Casualty Income, 1970-1990
As Percent of Net Premiums Earned



Source: A. M. Best (1991b).

(i.e., losses and underwriting expenses), investment income, and operating losses (underwriting losses less investment) for the seven largest lines of property-casualty insurance and for the overall industry. Table 3 contains growth rates in net premiums written for the 1980-1983, 1983-1986, and 1986-1990 time periods. The seven lines in the table represent approximately 81 percent of net premiums written in the property-casualty industry.

These tables highlight several important financial features of the past decade:

- Underwriting loss ratios above 100 appear to be the norm for each major line except private passenger automobile physical damage.
- Net investment ratios rose sharply between 1980 and 1984, and remained high.
- Overall operating ratios were over 100 for six lines in 1984 and four in 1989, compared to only two in 1980.

Table 2
Property-Casualty Underwriting Ratios
Selected Years, by Line

	Overall Operating Ratio			Net Investment Ratio			Combined Ratio		
Insurance Line	1980	1984	1990	1980	1984	1990	1980	1984	1990
Pvt Passenger Auto Liability	96	104	108	7.2	9.7	10.2	103	114	118
Pvt Passenger Auto Physical Damage	95.1	98.9	92.2	2.2	2.5	2.4	97.2	101	94.6
Commercial Auto Liability	101	131	102	8.5	12.4	12.0	110	143	114
Homeowners Multiple Peril	102	102	108	3.6	4.8	5.2	106	107	113
Commercial Multiple Peril	93.4	125	98.1	5.4	9.8	9.7	98.8	135	108
Workers' Compensation	90.7	105	104	10.8	16.7	13.0	101	122	117
Other Liability	92.7	125	86.7	14.5	16.6	22.7	107	152	109
All Property-Casualty	95.9	107	99.0	7.3	10.6	10.5	103	118	110

Source: A. M. Best (1991a).

- The three commercial lines of automobile liability, other liability, and multiple peril each display the pattern of very high ratios in 1984, along with sharp increases in premiums during 1983-86 and subsequent recoveries in the overall and combined ratios. By contrast, despite continuing large premium increases, private passenger liability ratios have been deteriorating.

2. Underwriting Cycles

As Figure 1 demonstrates, the profits of the property-casualty insurance industry have been subject to wide fluctuations. This pattern of alternating high and low profits is referred to as the "underwriting cycle". Most observers estimate the length of the cycle to be

Table 3
Property-Casualty Average Annual Premium Growth
1980 to 1990, by Line

	1980 to 1983	1983 to 1986	1986 to 1990
Private Passenger Auto Liability	7.9	12.2	9.7
Private Passenger Auto Physical Damage	9.1	12.6	6.0
Commercial Auto Liability	0.0	32.9	2.4
Homeowners Multiple Peril	8.4	6.7	5.1
Commercial Multiple Peril	1.9	30.5	2.3
Workers' Compensation	-0.6	13.4	10.9
Other Liability	-4.0	50.5	-1.6
All Property-Casualty	4.5	17.2	5.4

Source: A. M. Best (1991a).

approximately six years (Cummins and Outreville, 1987).[8]

There are a number of possible explanations for the industry underwriting profits cycle. Wilson (1981) argues that the cycle is driven by a tendency for the industry to switch from periods of extreme competition to periods of less competition. Stewart (1984) suggests that the reason for a reduced supply of insurance is that a capacity constraint on equity, which serves as collateral for insurance policies, becomes binding for stock companies. However, if capital markets are perfect, then (stock) companies could raise new equity externally and there would be no capital constraint. Thus, Stewart's capacity argument implicitly relies on

[8] However, note that Figure 1 does not display evidence of a six-year cycle.

an assumption that capital markets are imperfect.[9] Winter (1988, 1991) has incorporated the potential imperfection in capital markets into a model of underwriting cycles.

Venezian (1985) suggests that the underwriting cycle is a consequence of the manner in which insurance companies forecast losses in order to set rates. Insurance companies often project losses using an estimated regression. The error for projected future values can be correlated with error during the estimation period. Venezian showed that failure to account for this correlation was consistent with the observed underwriting cycle.

Venezian's (1985) study concludes that rates are set using biased forecasts. In contrast, Cummins and Outreville (1987) create a model in which unbiased rate setting causes the underwriting cycle. In the Cummins and Outreville model, underwriting cycles are caused by lags with respect to changes in contracts, regulatory lags, and reporting practices that average prices across periods.

Both Venezian (1985) and Cummins and Outreville (1987) suggest that the rate-setting process explains the underwriting cycle. By contrast, Doherty and Khang (1988) explain the underwriting cycle with a model containing both supply and demand equations for insurance. They include interest rates as a key explanatory variable, postulating that an increase in interest rates will increase the supply of insurance since firms want to obtain more funds with which to take advantage of profitable investment opportunities. Fields and Venezian (1989) provide additional evidence for the relationship between profit margins and unexpected interest rate changes. They further suggest that the determinants of the underwriting cycle differ across lines of insurance.

The presence of analyses that support a number of economic explanations for the property-casualty insurance underwriting cycle poses a problem for public policy. A policy that reduces the severity of underwriting cycles may be useful to ameliorate insolvency problems in the industry. However, the inability to distinguish among the potential causes of cycles makes designing an appropriate policy virtually impossible.

3. Trends in Profits

The presence of a cycle in industry profits makes it difficult to identify trends in a short period of performance history. Nevertheless, some observers find evidence of a long-term decline in profitability by comparing the cycles in the data presented above. Kramer (1991a) reports that total net income was 13.3 percent of net worth over the 1975-79 period, but only 8.7 percent over the 1980-84 period and 11.4 percent over the 1985-89 period. Kramer further reports that 1975 operating income was at a cyclical low of -1.4 percent of net worth and rebounded to a high of 20.7 percent in 1978; in contrast the next cyclical low,

[9] Myers and Majluf (1984) and Leland and Pyle (1977) have explicitly argued for the existence of capital market imperfections, suggesting that it may be expensive for insurance firms to add capital by raising equity externally.

1985, saw operating income bottoming out at -6.7 percent and rebounding to a more modest 11.2 percent in 1988. The lower results for the later period of his comparison suggest the presence of a downward trend. (This trend is masked somewhat by the five-year segmentation in the comparisons of average net income as a percent of net worth.) Kramer attributes the declining income trend in the 1980s to increases in the rate of growth in the components of underwriting costs for the liability lines — claims costs and loss adjustment expenses, which grew 166 percent and 203 percent, respectively - while premium revenues rose by 136 percent over the 1980-89 period.

Harrington (1991) and Winter (1991) observe that the dislocations in prices and markets which characterized the bottom of the cycle in the mid-1980s were excessive relative to previous cycle bottoms and were concentrated in the liability lines. Both authors cite the increases in cycle amplitude as additional evidence of a long-term decline in profitability arising from developments in tort law. Harrington also identifies unexpected growth in liability claim costs as "likely to have contributed to" the resulting increases in insolvencies during the 1980s decade.

The study by Clarke, Warren-Boulton, Smith and Simon (1988) concludes that the dislocation reached "crisis" proportions in only a few lines, and can be traced to the extreme instability of losses in these lines. However, they observe that unusually severe reductions in margins characterized all the lines during the time. The industry-wide underwriting results reflect this rise in costs; while the prior two peaks in underwriting income had been above zero, at the most recent (1987) peak, underwriting income was negative. Clarke *et al* also conclude that "much of the dislocation in property-casualty insurance markets may result from unanticipated and untoward changes in the way that courts establish tort liability and assess damages."

4. Tort Liability Costs, Issues and Responses

Many observers have addressed the impact on the industry of increases in tort awards during the past decade. Studies by the Department of Justice (DOJ, 1986 and 1987), by Danzon (1991) and by ISO (1987) have documented the problems posed by increases in tort awards. The DOJ study relies extensively on evidence from jury verdicts in medical malpractice and product liability cases in Cook County, Illinois and San Francisco, California, which reveals that:

- Between 1960 and 1984 the average medical malpractice jury award, adjusted for inflation, increased by 2,167 percent in Cook County and by 830 percent in San Francisco.

- Over the same time period the average product liability award, adjusted for inflation, rose by 212 percent in Cook County and by 1,016 percent in San Francisco.

- The increases in mean awards was almost entirely due to increase in the number of extremely large awards.

The DOJ examination (1987) also shows that, along with the increasing average jury awards, the percentage of cases in which plaintiffs prevail before juries has also steadily increased. In the product liability cases in Cook County and in the malpractice cases in both Cook County and San Francisco, plaintiffs have roughly doubled the percentage of tried cases in which they prevail before juries.

Danzon (1991) reports that the frequency of malpractice claims per hundred physicians has increased roughly 10 percent a year for the last two decades. Claim severity (average amount per paid claim, including jury verdicts and out-of-court settlements) has risen at roughly twice the rate of increase of the consumer price index, with evidence of higher growth for the highest claims. She believes it likely that the increase in claim frequency is a response to the higher expected awards.

The study by ISO confirms that a small percentage of claims play the most important role in determining insurer losses. For instance, only 2.9 percent of claims resulted in payments exceeding $75,000. However, these claims accounted for over 54.2 percent of total losses. Furthermore, claims that take a long time to resolve also account for a disproportionate amount of total losses. Although only 12.0 percent of claims took more than three years to resolve, these claims accounted for 44.3 percent of all losses. The impact of rising costs in the medical malpractice line is described in more detail in Section V below.

Another study by ISO (1990) examined the legal costs of insurers, finding that legal defense costs rose 45 percent faster than the cost of actual compensation from 1978 to 1988. Legal defense costs were nearly 14 percent of losses in 1988, compared to 9.6 percent of losses in 1978.

Many observers believe that the rise in liability insurance costs has increased the amplitude of the underwriting profits cycle. As Winter (1991) reports, the doubling or near-tripling of liability premiums for some lines in 1984-86, which followed a period of depressed premium revenue, was accompanied by sudden and severe dislocations in the liability insurance markets, particularly medical malpractice and some general liability insurance lines. Winter observes that third party liability involves long-tailed risks. Hence, it introduces uncertainty into the already cyclical liability insurance markets, and represents a major factor in the dislocation process. Concluding that "the rules governing liability should be stable and predictable," Winter suggests that the search for stability may include some restraints on expansions of third party liability.

Regulatory Responses. The regulatory response to rising costs has been focused primarily upon the increases in the costs of private passenger auto and workers' compensation insurance, because of the perceived public good nature of these lines. The rapid rise in

costs prompted insurers to seek corresponding premium increases. In response, many state regulators have turned to rate suppression as a useful tool for achieving affordability in the private passenger auto and workers' compensation lines. As Kramer (1991b) describes, rate suppression has been applied in a number of ways — for example, not permitting average rate increases to keep pace with state-wide increases in costs ("overall rate suppression"), or not permitting losses incurred in residual markets to be covered by increases in rates in the voluntary market ("selective rate suppression"). Rate suppression may also be applied to particular groups or classes of consumers. If insurers are able to recoup losses from selective rate suppression in their unregulated markets, so that the unregulated markets provides cross-subsidies to the rate-suppressed markets, overall rate suppression may not result. However, insurers are not generally able to pass on the costs of one market to another, because they do not have sufficient monopoly power in the unregulated market (See Section 5 below.)

The inability to fully cover cost increases through premium increases provided incentive to insurers to restrict coverage for all but the lowest risk groups; the rise in premiums caused lower income insureds to forego purchase of insurance altogether or seek coverage in the residual markets in which rates are generally held below costs. As a consequence of both of these factors, many residual markets have grown immensely over the 1980s decade.

While each form of interference in the market has its own repercussions, rate suppression and the growth in residual markets have had a negative impact on the performance of insurance firms. In states where the suppression was substantial enough to causes losses that cannot be offset from other sources, the insurers lost net worth. Where the situation was less extreme, rates of return were lowered; companies with returns below their costs of capital will not be able to attract new capital. Section V describes rate suppression in the private passenger and workers' compensation lines in more detail.

Legislative Responses. Most observers recognize the inefficiencies of the tort liability system in addressing two of the three major objectives of liability law — determining fault and allocating compensation. In response to increasing costs, insurance firms have pressed for two major changes: court procedure changes that would reduce court delays and expense, and tort law changes. Reforms of tort liability rules have been enacted by several state legislatures, including setting limits on noneconomic and punitive damages, requiring the victim's first-party insurance to offset the damage judgment, and amending liability standards for specific activities. These reforms are partial in nature, with limited benefits; nevertheless, tort law changes enacted since 1985 are alleged to have resulted in some reductions in insurance losses.[10] In particular, Danzon (1991) reports that, in the case of medical malpractice insurance, the caps on awards and the requirement of collateral source

[10] Insurance Information Institute (1991).

offset, preventing multiple recovery of damages, had reduced claim severity, and shorter statues of limitations reduced claim frequency.

The administrative nature of current workers' compensation programs and, in some states, the presence of "no-fault" private passenger auto insurance represents attempts at basic reform of tort liability. These reform systems and their impact on these two lines are described in more detail in Section V.

5. Solvency Issues and Measures

Issues. As previously indicated, the investment portfolios of property-casualty insurance companies generally do not pose a risk of severe deterioration. Rather, Kramer (1991a), as well as other observers, believes that insolvency risk arises from unrecognized shifts in the underlying structure of losses not adequately covered by reserves, e.g., increases in claims costs due to tort liability, and the potential of extraordinary losses from catastrophic events having systemwide impact or from environmental liability coverage. Another threat to solvency, according to Kramer, is the pressure on operating margins from regulatory practices that do not allow rates to adequately reflect claim costs.

The beliefs of Kramer and other observers about the danger of inadequate reserves have been supported by A. M. Best Company (1991b). After examining all property-casualty company insolvencies occurring since 1969, Best concludes that deficient loss reserves and rapid growth of the firm's book of business accounted for the majority of insolvencies. Best found that fraud and large reductions in reported asset values (following, e.g., declines in market values or discovery of misstatement of values) were the next most significant causes of insolvencies. The underwriting cycle placed additional stress upon companies affected by these factors; the frequency of insolvencies was found to vary with the underwriting cycle, and the magnitude of the insolvencies varies with the severity of the cycle. Best also found a relationship between insolvencies and regulatory control of rates, with the prior approval states experiencing greater proportions of company insolvencies. The report by the Subcommittee on Oversight and Investigations of the U.S. House Committee on Energy and Commerce, chaired by Rep. John Dingell (1990), also examined four recent insolvencies. The Dingell report concludes that these were the result of gross mismanagement and fraud, coupled with weak solvency regulation by the states.

The possibility of losses from a severe earthquake represents a significant catastrophe risk from a broad industry perspective. In 1990 Congress mandated an examination of the economic impacts of a hypothetical earthquake. The resulting study (Milliman, 1991) analyzed the impact on the banking, insurance and financial markets of a hypothetical earthquake causing $40 billion in total insured losses. The conclusions reached by the study were that the insurance industry could experience financial stress, with the potential for bankruptcies of several firms. The event was not expected to devastate the entire industry. The study noted that the coverage purchased for such losses is low due to the lack of demand from both residential and business customers. However, significant losses in non-

earthquake lines would be triggered as a result of the quake, and claims for such losses would have to be honored even if coverage for actual quake damage was not purchased.

The availability of traditional risk-mitigation methods — reserves for losses and reinsurance — would be of limited help in the event of a catastrophic occurrence such as the hypothetical earthquake. The difficulty of predicting such events and the interdependence of the losses makes pooling of losses inefficient for smaller or regional firms. Furthermore, additions to reserves to cover losses for which firms have no actuarial data from the most recent 5 year period is not an allowable business expense for tax purposes. Thus the primary insurers have routinely turned to reinsurers for protection against catastrophic losses. However, while reinsurance coverage is available for earthquakes and other natural disasters, reinsurers will in all likelihood be hit more severely than the primary insurers, since their reserves for events as unpredictable as major earthquakes are likely to be insufficient. This would expose the primary insurers to additional losses.

The cost pressures from increased environmental liability losses may represent a more severe threat to solvency in general liability lines than the danger of natural catastrophes, both because the probability of the event is greater and because the amount of the losses may even exceed that of the earthquake scenario. Shapiro (1991) points out that the legal scope and standard of liability has expanded significantly over the past 30 years for a number of parts of the liability system — notably, medical malpractice, product, occupational, and environmental. This has produced significant premium growth, causing dislocations in product and service markets. The dislocations are particularly severe in the "toxic tort" and environmental liabilities. As Menell (1991) observes, in these lines the liability system becomes an "extremely costly claims processing institution" without being able to deter future risky behavior. Efficient deterrence of an injury-provoking action requires the ability to trace the cause of the injury to the event, and to anticipate that future events may cause injuries. Because of the nature of the risks in these lines, the liability system is particularly inefficient at determining causation. Even when causation can be established, the liability is often assigned retroactively to firms that could not have anticipated the extent of the risk or their future liability. Thus, Cooter (1991) concludes that, rather than providing a deterrent to risky behavior, the system becomes a disincentive to production and stifles innovation.

A case in point is the regime for clean-up of dangerous hazardous waste sites. As Kramer (1991a) points out, the dollar cost in cleaning up waste is unknowable, with estimates ranging from under $100 billion to over one trillion dollars. Estimates of eventual insurer liabilities fall between $26 and $213 billion in present value dollars. Because insurers did not foresee the broadening of liability under the courts, reserves are inadequate to cover losses of such magnitude.

Measures. Various financial ratios can be used to examine the ability of the industry to withstand unexpected shocks. One measure of a company's financial strength is the size of its net worth relative to asset and liability values. Kramer (1991a) reports that the average

net worth/asset ratio for property-casualty insurers over the 1980s was slightly under 28 percent, a figure considerably in excess of that of life and health insurers. Furthermore, the industry's ratio of net worth to assets has actually risen over the 1980s. As Kramer observes, this does not necessarily indicate unusual safety; the excess is needed to compensate for the relative inability of property-casualty firms to estimate future costs, and hence the greater uncertainty about reserve adequacy.

Some additional indicators of industry solvency trends have been reported by Kramer (1991a) and Harrington (1991). Harrington reports that the number of property and casualty insurance firm failures rose over the 1980s, peaking in 1985 at 25, falling and rising again slightly from 1986 through 1989. More important than the number is the size of failures; Kramer reports that the asset value of failed firms in 1987, the peak year for this measure, was $1.3 billion. He finds that the performance of the weakest one-fifth of the industry (defined by low levels of income and capital) deteriorated from 1987 to 1989, with a net worth ratio of 15 percent at year end 1989 (compared to the industry average of 30 percent). Yet the aggregate net income of these members was positive. Only 140 companies, representing 7.3 percent of total industry assets, recorded negative net incomes in 1989.

As indicated above, the scope of this study is not sufficient to assess the threat of future insolvencies. As Kramer (1991a) observes, such assessments must be the product of analysis of individual companies, and must examine a range of factors specific to the company's business, its capital and reserve adequacy, earnings power, asset quality, interest rate exposure, and liquidity risk. The studies reviewed in this paper do not foresee any solvency crisis for the industry. Kramer concludes that "barring extraordinary catastrophe losses, a large property and casualty insurance insolvency in the foreseeable future is extremely unlikely...there is no evidence today that the insurance industry faces a systemic solvency crisis..." The Dingell report also finds "no evidence of an overall crisis threatening the existence of the industry." Harrington (1991) reports that industry analysts generally believe that the financial condition of the industry is "basically sound." The Best study concludes that "we do not expect insolvencies to approach levels experienced in 1985." These general comments do not imply that individual insolvencies will not continue.

IV. The Existence of Competition

1. Introduction and Summary

Resources are allocated and incomes distributed most efficiently, with the greatest freedom of opportunity, under competitive market systems. Therefore, public policy decision-making regarding an industry should be shaped by the degree to which it is

competitive. Those features of the market generally regarded as sufficient to assure the existence of competition are:

- a large number of buyers and sellers;
- a standardized product;
- relative freedom of entry and exit;
- inability of any individual buyer or seller to exert significant influence on price;
- absence of collusive ability;
- absence of excess profits.

Following Markham (1950) we will judge the property-casualty insurance market to be workably competitive if, after analysis of its market structure and performance characteristics and comparison with these norms, no public policy change can be found that would potentially bring about societal gains greater than attendant losses.

There have been many studies of the structure, conduct and performance of the property-casualty industry. By virtually all measures, the studies have found that the industry is competitive in those state jurisdictions which permit competition. In most of these markets, there are a large number of firms and barriers to entry are low. While, under the McCarran-Ferguson Act, certain protections exist that allow the sharing of information used for price-setting, the studies have found no significant evidence of above-competitive returns as a consequence of this activity.

2. Concentration

There are several different ways to measure industry concentration. Although simpler, narrower measures can be constructed, we have chosen to use the Herfindahl-Hirschman Index (HHI) because it is a complete measure of concentration, incorporating information on all firms in the industry. The HHI is defined as the sum of the squares of each firm's percentage market share, and thus can range from a low of zero (for an industry with an infinite number of identical firms) to a high of 10,000 (for a monopoly). The Department of Justice uses the HHI as a guideline to evaluate the anti-competitive effect of proposed mergers. Under their guidelines, a merger would be viewed as acceptable if the post-merger HHI in the industry were projected to be less than 1,000.

Concentration at the National Level. Table 4 presents HHI values for individual property-casualty insurance lines and for the property-casualty insurance industry as a whole. These data suggest that insurance industry concentration is quite low. With the exception of the small boiler insurance sector, the values in the table are well below the level that

Table 4
Herfindahl Indexes
By Line, 1990

Line	HHI
Fire	194
Allied Lines	213
Farmowners Multiple Peril	218
Homeowners Multiple Peril	642
Commercial Multiple Peril	264
Ocean Marine	422
Inland Marine	212
Medical Malpractice	443
Workers' Compensation	357
Other Liability	494
Aircraft	436
Private Passenger Automobile	737
Commercial Automobile	184
Fidelity & Surety	320
Boiler and Machinery	1,681
Reinsurance	799
Personal Lines	716
Commercial Lines	193
Accident & Health Lines	973
All Property-Casualty	278

Source: A. M. Best (1991a)

would prompt Justice Department concern. Our results are similar to those obtained by, among others, the Department of Justice (1977), Danzon (1983), Harrington (1987), and Clarke *et al* (1988). The low levels of concentration confirm the presence of many firms in the industry, with little natural "leadership," suggesting that effective price-setting collusion would be difficult on a national basis.

Table 5
Three-Firm Concentration Ratios
By Line and State, 1989 (%)

State	Medical Malpractice	Workers Compensation	Auto Insurance	All Prop.-Casualty
California	55.0	19.4	38.1	25.3
Florida	62.1	28.6	40.9	28.1
Indiana	80.7	24.4	37.5	24.4
Kentucky	62.2	28.9	41.9	25.1
Maryland	70.1	25.6	39.1	26.5
New Jersey	93.5	35.0	25.8	17.7
New York	64.5	25.2	34.0	21.7
Texas	61.8	24.8	42.5	23.2
Vermont	94.2	34.1	30.6	21.0
Nine-State Average	71.6	27.3	36.7	23.7
All U.S.	23.9	21.8	31.6	20.2

Source: A.M. Best Management On-Line Reports.

Concentration By Line and State. Since insurers do not have the same market share in all states, the national concentration measures may underestimate the degree of concentration in individual states. Table 5 presents three-firm concentration ratios for three individual lines (analyzed in more detail in the next section) and for the industry as a whole, in nine selected states representing a range of market sizes. The national three-firm concentration ratios for each line are also shown in order to make comparisons with the individual state markets.

As Table 5 indicates, while the averages across the nine states are higher than the national average, a wide difference between national and state concentration ratios occurs only in the medical malpractice line.[11] Thus our preliminary evidence implies that, at the state-level market as at the national, collusion would be difficult without an external agent (such as the state regulator) to set prices. The apparent exception to the concentration behavior, the medical malpractice insurance market, will be examined in more detail below.

[11] The data on state-wide auto insurance concentration ratios include both private passenger auto and commercial auto. Because the dominant sellers of private passenger auto and commercial auto are different, the measurement of concentration from the overall data will not be accurate for each separate line.

3. Self-Insurance

Self-insurance is an alternative to the purchase of commercial insurance, and its existence provides further evidence of the difficulty of collusion. In property-casualty insurance, there are several ways in which a firm or group of firms can manage risk through self-insurance schemes. The methods include the creation of a wholly-owned "captive" insurance firm, the creation of an association or group captive, and the creation of purchasing groups. Physician-sponsored firms in medical malpractice insurance are examples of association or group captives.

Self-insurance is most prevalent in large firms, where the size and capitalization increase the ability to bear the risk of large losses. However, smaller and medium-sized firms can manage risk by participating in risk retention groups.

There has been a very large increase in corporate self-insurance over the past two decades. There are two reasons for this development: first, firms have sought to lower liability costs; and second, self-insurance as a competitive alternative to traditional insurance was promoted by the Risk Retention Amendments of 1986 and recent court decisions that have clarified the extent to which premiums paid to a captive insurance firm are tax-deductible. Given its increasing prevalence, we conclude that self-insurance is a viable source of "competition" that further reduces the ability of firms to form cartels.

4. Product Standardization

Markets with truly homogeneous products offer no basis for price differentiation. The inability of the customer to distinguish among products is a prerequisite for setting above-competitive prices. So long as the customer can adequately judge the product, it is difficult for an individual producer to charge a higher than competitive price for an undifferentiated product. Although insurance services are not inherently homogeneous, a side-product of the collective activities protected by the McCarran-Ferguson Act is the cooperative development of common policy forms. The use of these forms provides benchmarks for price comparisons across providers and time, making it difficult for single providers to exercise market power by exploiting the inability of consumers to compare insurance coverage.

5. Barriers to entry/economies of scale

The barriers to entry test is a vital one: without barriers to entry, any ability to earn above-competitive returns in an industry is only temporary because it will attract new firms that can compete away the profits.

A number of factors explain the low entry barriers in the insurance industry. First, regulatory barriers are low; in order for an insurer to engage in business, it must present plans to the insurance commissioner in the state in which it intends to do business and must meet modest capital requirements. Secondly, the existence of an independent-agent

marketing system reduces marketing barriers, affording entering firms the benefits of the consumer acceptance through the independent agent without investment in fixed marketing costs.[12] Thirdly, the information sharing among insurers permitted by the McCarran-Ferguson Act to pool loss information and to share data analysis reduces the entry barriers that result from lack of knowledge of new markets. Without shared data it might be extremely difficult for a firm to estimate losses in new lines of insurance and/or new states.

Fourthly, the apparent absence of economies of scale in the property-casualty insurance industry also facilitates entry. The primary sources of potential scale economies in this information-intensive industry would be the administrative and "back-office" functions, particularly in the determination of prices. The process of price-setting calls for the estimation of future losses, a statistical process requiring large amounts of data and staff expertise. The wide range of actuarial services offered by the extensive staff of the rate service organizations allows new and small firms to compete with larger firms. A number of studies, among them Joskow (1973), Ippolito (1979), Cummins and VanDerhei (1979) and Johnson, Flanigan, and Weisbart (1981), have attempted to measure economies of scale. Most of these studies are consistent with small economies of scale in the property-casualty industry. However, the lack of a good proxy for output makes careful measurement difficult.

Finally, entry may be unwittingly discouraged by state regulatory restrictions on exit from individual markets. In particular, Massachusetts and New Jersey have stringent rate regulation and have also adopted laws discouraging exit. Massachusetts authorized the insurance commissioner to revoke licenses in all lines for a firm exiting the private passenger automobile insurance market. New Jersey also authorized its commissioner broad powers to impose such onerous conditions on exiting firms. Ballen (1991) points out that such barriers to exit in insurance inhibit entry. By forcing the firm already in the market to take losses on their investment, they raise the capital level needed by potential entrants to protect themselves against such situations.

6. Absence of Excess Profits from Collusion

Cooperation among insurers to collect industry-wide data and to project future aggregate cost estimates is legal by virtue of the McCarran-Ferguson Act and is facilitated by industry-owned rating bureaus. Whether the cooperative practices support collusion among firms to earn excess profits is central to the debate over the repeal of the antitrust exemption. Critics of the exemption argue in the affirmative. Defenders argue that rating bureaus play a large role in lowering information costs for all firms and reducing barriers for potential entrants, thereby enhancing competition in the market. In addition, they argue

[12] See Cummins and VanDerhei (1979). In a given market, entry cost barriers are substantially higher for "direct-writer" firms than for "independent-agent" firms because a direct-writer entering a new market will incur substantial initial organization and promotion costs to introduce the product directly to the uninformed consumer. Joskow (1973) and Frech and Samprone (1980) have commented on the differing cost structures of these two marketing systems. As they document, the independent agent system is costlier on a continuing basis.

that cooperation among insurers reduces the tendency for naive or optimistic insurers to issue policies at a price too low to support their future costs, reducing industry volatility. In this view, so long as it does not lead to excess profits, cooperation among property casualty insurers increases efficiency, and may enhance the financial stability of the industry.[13]

The search for the evidence of excess profits in the industry has been extensive. Although generally limited to personal insurance lines, particularly private passenger auto insurance, some studies have been made of the commercial auto, medical malpractice, and general liability lines. The studies can be broadly characterized by their different hypotheses regarding the source of excess profits. As indicated above, the barriers to entry are insubstantial, and levels of concentration are low, making it difficult to enforce cartels. Without enforcement, cartels are unstable, making consistent excess profits impossible. Joskow and McLaughlin (1991) conclude that "the property-liability insurance industry clearly does not have the natural monopoly or natural oligopoly characteristics" to form the basis of successful collusion or cartelization.

In view of the lack of evidence of "natural" causes, many analyses of the industry have turned to hypotheses of "regulatory" cartelization, arguing that price-setting cartels can exist only through regulatory support. Thus, price-setting behavior may have existed in prior-approval states when the regulations on deviations were sufficiently restrictive to enforce the collective rates set by the bureau. The studies compare the variability of price levels around the mean rates and in differences in price levels for equivalent insurance lines between prior approval and open competition states. A finding of significant differences between the two regulatory settings constitutes evidence for regulatory cartel hypothesis.

Joskow (1973) compared a prior approval state with an open competition state and found greater adherence to bureau rates under prior approval. The Department of Justice (DOJ, 1977) studied the levels and dispersion of prices in an open competition state and two prior approval states, concluding that there were meaningful price differentials between bureau and off-bureau rates in all states, but that the open competition state appeared to have a greater variation. A study by the Independent Insurance Agents of America (IIAA, 1978, summarized by Danzon, 1983) examined the pricing patterns of large companies in all states during 1974-76, concluding that the majority of large firms did not use bureau rates, even in the prior approval states.

Danzon (1983) has examined a number of these pricing pattern studies. She concludes that regional patterns, such as regional differences in regulatory behavior, may be at least as important as prior approval in determining the extent of adherence to bureau rates. Consequently, she suggests that conclusions based on studies of only a few states may be misleading. In addition, she observes that the IIAA findings on the deviations of large firms

[13] See Harrington and Danzon (1991) for some evidence relating to the impact of pricing on industry stability.

from bureau rates were contrary to rational behavior of a cartel (in which the large firms would be expected to set the price levels and smaller firms to deviate). Danzon concludes that the cartelization of pricing is not viable.

State-level Profits. Many empirical studies have examined data on loss ratios by individual line from a few states. Harrington (1984) has summarized a number of such studies of property-liability lines using the state-level data to examine the fegulatory cartel hypothesis. He concludes that prior-approval laws have apparently promoted adherence to bureau rates in some states. However, the increases in upward price deviations following introduction of competitive rates in some other states, and the evidence of deviations in pricing around bureau rates before such introduction, indicates that the conclusion cannot be generalized. He infers that the impact of prior approval regulation is uncertain, and depends upon different theories of regulatory intent. He further suggests that evidence drawn from small samples may be misleading. He concludes that the overall evidence in favor of a direct linkage between excessive price levels and prior approval states is weak.

Grabowski *et al* (1989) have examined results from additional studies, including those of Pauly *et al* (1986) and Harrington (1987). Grabowski *et al* conclude that the studies using data from the late 1970s suggest that regulation in this period constrained prices. They also present evidence from their own study of the 1970s which provides additional support for the constraint hypothesis.

As Danzon (1983) comments, underwriting profits are only a part of returns to capital; studies of excess returns should take into account the other factors — other expenses, investment income, taxes and business risk and the size of reserves. While some of the studies of loss ratios (in particular those using regression analysis) have attempted to adjust for some of these factors, Danzon argues that they did not generally do so in an accurate manner. Similarly, Harrington observes that, because investment income and national expenses are not generated in state-level markets, studies using state-level profitability measures may be misleading.

Firm-level Profits. Examination of firm-level profits can address the criticisms of state-level studies. However, firm-level studies are not designed to test the regulatory cartel hypothesis through comparisons. Consequently the analyses at the firm level must develop other criteria to measure excess profits. Studies to date have measured excess profits as deviations from a "market" or equilibrium rate of return earned as compensation for business risk in competitive markets; they have searched for evidence by comparing actual returns to a measure of the equilibrium or competitive return. The studies by Hill (1979) and Fairley (1979) examined whether the rates of return to capital were excessive in a limited number of stock insurance companies for 1951-65 and 1971-75 respectively. Both adopted the capital asset pricing model as the measure of competitive return, and search for excess returns by comparing actual returns with returns generated by the model. Fairley concluded that profit margins were roughly competitive for some lines, but above competitive for workers' compensation insurance. Hill found weak evidence for excess

profits in most of the six companies in his study. In her evaluation of these and other excess profits studies, Danzon (1983) observes that the errors in determining the adjustment for risk may be sufficient to render their conclusions insignificant.

V. Issues in Individual Lines

The many insurance lines within the property-casualty industry differ greatly with regard to their structure, financial performance, and regulatory environment. Yet there are similarities: the lines involving the medical care and personal injury litigation systems have been particularly affected by the sharp rises in claims costs during the 1980s, and significant affordability and availability problems have arisen in lines in which universal coverage is deemed a social need - notably, the private passenger auto and workers' compensation lines which together comprised 50 percent of the industry's premium volume in 1990.

Claims costs have risen at a rapid rate in the private passenger auto and workers' compensation lines. Joskow and McLaughlin (1991) report that, while the general price level increased by 19 percent between 1983 and 1988, auto insurance premiums per vehicle (including both liability and property damage coverage) rose by about 60 percent and losses increased by a slightly greater amount. Kramer (1991b) reports that claims cost rose 99 percent for private passenger auto and 120 percent for workers' compensation, compared to a growth rate of 75 percent for all other property and casualty lines combined. Over the 1984-1989 period, workers' compensation claims costs rose at an average annual rate of 14 percent; auto insurance claims costs rose at an average annual rate of 12 percent, and the liability component of the auto line rose at an average annual rate of 15 percent, compared to an average annual claims cost growth rate of 8 percent for all other property and casualty lines. The auto and workers' compensation growth rates outpaced such cost factors as increases in inflation, population, car ownership, size of the workforce, fatality rates or industrial accident rates.

In this section we focus on those lines in which rising costs have raised substantial public concern. Because we have found that, of the three lines discussed in this section, only medical malpractice displays unusual concentration, we discuss this structural feature only for that line.

1. Medical Malpractice Insurance

As relatively uninformed purchasers of medical care, patients demand a mechanism for redressing unsatisfactory treatment outcomes. Thus, medical care providers are subject to a negligence rule of liability. The providers, in turn, purchase medical malpractice insurance to avoid the risk of large financial losses.

The presence of small risk pools, long lag periods and wide variation in claim severity makes prediction of losses difficult and causes the medical malpractice market to be relatively unstable, with wide variability in loss ratios both across states and over time. This instability is reflected in recent performance. In the late 1960s and early 1970s, the line was the focus of public attention because of sharp increases in both the frequency of claims per physician and in average claim severity. Many states enacted tort reforms in order to stem the rise in claims; several states began a policy of rate suppression, disallowing requested rate increases, to assure the affordability of malpractice insurance. The tort reforms offered some relief, but the upward trend in claim costs and insurance rates resumed in the early 1980s, leading to another "crisis" within the insurance line in the mid-1980s.

The crisis of 1984-86 is believed (Joskow and McLaughlin, 1991; see also Winter, 1988 and 1991) to have reflected the changes in a number of economic variables, including increasing current claims costs, uncertainty over future costs as liability standards continue to change, and declining investment income. All these factors combined to decrease earnings and, hence, additions to surplus. Coupled with the withdrawal of some reinsurance capacity, they led to short-run constraints on the capacity to write insurance and sharply higher prices on such insurance as was written.

The instability fosters greater concentration in the market. As Table 5, Section IV, shows, the three-firm state-level concentration ratios for medical malpractice dramatically exceed the ratios for workers' compensation, private passenger auto liability, and property-casualty insurance in general. The high degree of concentration stems from the growth in group-sponsored mutual plans (sponsored by state or local medical societies, or, more recently, physicians or hospitals). These plans were initially formulated as a response to the withdrawal of national companies from many markets in the mid-1970s. They possess several cost advantages that allow them to better absorb the instability inherent in the line. Consequently, they currently dominate the market, particularly in those states that have noncompetitive rating laws, from which the nationals retreated. Over half of the total dollar volume of physician insurance is now written by physician-owned mutuals, and the majority of hospitals practice some form of self-insurance. Entry and exit appear to be relatively easy (Blair and Makar, 1988; Danzon, 1985), and the threat of potential entry forces the markets to behave competitively, despite the high concentrations.

The operation of the tort liability system is regarded by many as an inefficient medical liability regime. As Newhouse and Weiler (1991) observe, were the tort system to efficiently internalize the cost of negligent injuries to the physician and promptly compensate in full for past injuries, it would be socially optimal. However, these conditions are not satisfied in practice. The primary flaw is that the service is traded infrequently, under conditions of severely asymmetric information. Patients do not have, and cannot acquire, the ability to make informed purchases of medical services. As a consequence, exposure to liability for malpractice is the physician's primary incentive to take due care.

The thrust of the incentive is minimal. While nearly all physicians purchase malpractice coverage, the experience rating is minimal, so that the cost of negligent acts are spread over all participating physicians in the given specialty and area. Furthermore, only about 10 percent of the cases involving negligence result in claims. Thus the individual physician internalizes little of the injury cost. Furthermore, the presence of health insurance, which pays for the bulk of medical care without significant cost incentives, allows the physician to pass on cost increases due to rising malpractice insurance premiums. In addition the tort system carries a high transaction cost burden, primarily due to the lengthy discovery process, which bars many small claims, reduces compensation, and imposes additional uninsurable defense costs upon physicians. These costs induce the physician to take medical precautions, known as "defensive medicine," defined as changes in medical practice that are intended to minimize the likelihood of successful claims, whose value to the patient is less than the cost of production. The costs of such procedures can be passed on through the health insurance system.

The recent performance of the medical malpractice line bears testimony to these serious problems. Although masked to some degree by the instability, the frequency and severity of malpractice claims has continued to increase dramatically over the last two decades. Danzon (1991) concludes that, although measurable medical and legal factors can account for some of the trends, much of this growth is unexplained. The increased liability costs appear historically to have been passed along promptly to patients through fees. As Danzon observes, the historical ability to pass on most rate increases is not surprising in view of the prevalence of first party and social insurance which pays for the majority of health care.

The linkage between liability costs and increases in "defensive" medicine is difficult to establish because it is difficult empirically to separate changes induced by the presence of health insurance from changes induced by malpractice liability costs. Heavily-insured patients have little incentive to refuse any treatment with potential benefit, even while the physician may be engaging in it primarily to reduce the risk of malpractice suits.

However, Danzon reports that the cost increases appear to have induced some other changes which suggests that the ability to pass along cost increases may not continue unabated. Some evidence exists that reimbursement rates by health insurers were somewhat less responsive to insurance cost increases in the 1980s than in the 1970s, probably reflecting attempts by these insurers to control costs in general. This would reduce the future ability of physicians to pass along the insurance premium increases, forcing them to seek means to reduce premium expense. Indeed, Danzon reports that physicians in states with unusually high malpractice insurance costs recently appear to have taken on more uninsured risk. In addition, both hospitals and physicians have adopted more extensive risk-management programs. Also, as indicated above, there has been continued growth in the physician mutuals and, in some states, growth of joint underwriting associations, the residual markets to which physicians turn as an alternative to the voluntary markets. Finally, Danzon reports the results of a survey, taken just after the 50-100 percent increase in malpractice rates that

occurred in 1985, indicating that a significant share of physicians had stopped performing high-risk procedures.

In sum, the current malpractice liability system does not appear to be a cost-effective deterrent of negligent injury. Newhouse and Weiler (1991) observe that, while a number of state legislatures have introduced changes in the tort system, none of the changes address the fundamental flaws. Danzon (1991) has also concluded that changing the liability system without correcting the flaws will not increase efficiency.

2. Workers' Compensation

Workers' compensation insurance provides coverage for job-related injuries and some diseases. Viscusi (1988) describes it as being one of the job-related health and safety mechanisms designed to provide an efficient deterrent to job-related accidents through modification of both employer and worker behavior and efficient compensation for workers injured or made sick on the job. The other components of the occupational health and safety mechanisms are the existing marketplace incentives to take care, the presence of direct regulation by the Occupational Safety and Health Administration (OSHA), and the limited recourse to the civil liability system.

The current workers' compensation system is a form of "strict liability" that actually operates outside the tort liability system; the employer generally has no tort liability to the employee. Compensation for injuries suffered on the job is determined administratively, with levels limited to economic losses, based on state-set formulas, and funded through employer insurance premiums. To receive benefits, the worker must establish that the injury or illness is job-related. Contested cases are resolved through litigation. The schedules for recovery amount (which are untaxed) typically provide for replacement of two-thirds of wages, subject to minimum and maximum levels and durations. Although the worker is generally barred from seeking further recovery from employers through the tort system, workers may sue the manufacturers of products used in the workplace, and employer lawsuits are allowed in cases of extreme negligence or intentional misconduct. Insurance premiums are generally determined by experience ratings.[14]

The administrative nature of the system arose as a public response to the difficulty and inefficiency resulting from reliance on marketplace incentives to provide for workplace safety and on the tort liability system to obtain compensation for job-related injuries. The market does provide some incentive; surveys indicate that workers are aware of many risks facing them on the job, and accordingly receive measurable wage and benefit premiums for

[14] Kramer (1991b, page 88) reports that, while only about 15 percent of firms are experience rated, these firms employ approximately 90 percent of all workers. Kniesner and Leeth report that the small firms are only imperfectly rated.

additional risk. However, workers are often unable to judge fully the risk of the job situation and demand insufficient wage compensation for the risk so that the employer's market incentive may not be sufficient to assure *ex ante* safety. Reliance on the tort liability system to provide sufficient compensation for job-related injuries has historically been problematic due to the costs and time delay inherent in the system and the requirement of proof of negligence on the part of employers.

The states have imposed regulatory environments that reflect the public nature of the compensation program. In the past most states have severely constrained variation in premium rates across insurers. Kramer (1991b) reports that such restrictions still apply in most states. Six states have established state insurers that provide all workers' compensation insurance in the state; 12 more have state insurers that compete with private insurers. Most states with prior approval regulation only allow uniform percentage deviations from bureau rates. States permit firms which meet certain financial tests to self-insure, and industry estimates suggest that at least 35 percent of private sector employees covered by the workers' compensation system are insured by their own firms.[15]

Workers' compensation costs have risen dramatically in recent years. Kramer (1991b) reports that claim costs have grown more rapidly over the 1980-89 period for workers' compensation and private passenger auto liability insurance than for all other property-casualty lines combined.[16] Both he and other observers (Viscusi, 1988 and 1991) find that the surge in workers' compensation claim costs reflects rapidly rising medical costs, increases in the number of claims leading to indemnity payments, and increases in the use of litigation to resolve disability claims and claims arising from job-related illnesses.

Conflicting incentives within the compensation structure may contribute to the increases in workers' compensation costs. Although workplace safety is the product of effort by both the employer and employee, the current compensation system compensates the worker regardless of fault (assuming fault lies entirely with the employer) and accordingly attempts to internalize costs to the employer, potentially reducing the workers' incentive to take safety precautions. The employer may be able to pass costs back to the employees through wages (depending upon the labor market); however, unless wages are negotiated individually, careless employees are insufficiently penalized. Kniesner and Leeth (1991) report research that higher benefits are linked with increases in claims for disability injuries, which tends to confirm the hypotheses of excess usage for minor injuries. They further report that studies focusing on extremely severe injuries have found that higher benefits improve safety, suggesting that the additional costs have encouraged employers to invest in workplace safety measures. In addition, because state officials set compensation formulas,

[15] The estimate, provided by Insurance Information Institute, 1992, does not include public sector employees.

[16] Claims costs rose 99 percent for private passenger auto and 120 percent for workers' compensation over the 1980-89 period; the corresponding growth rate for all other lines combined was 75 percent.

the benefits can be influenced by political considerations and may become the product of compromises between employee and employer groups.

The growth in residual markets reflects the market distortions triggered by the cost increases. Kramer (1991b) reports that the residual market share of earned premium in states with residual markets administered by the National Council on Compensation Insurance (the large majority of states) grew from 6 percent of the line in 1984 to 19 percent in 1987, and to 24 percent by 1990. Residual market shares in states which have attempted to hold down rates have risen more than in other states, reflecting the insurers' attempts to reduce business. Kramer (1991b) reports that, in states which have attempted to hold down rates, the average residual market share of earned premium in 1987 was approximately 26 percent of the total (excluding self-insurance); the average residual market share in other states was 12 percent. The highest residual market share exceeded 70 percent.

The performance of the industry has accordingly suffered. Kramer (1991b) concludes from his studies of individual firm financial conditions that rate suppression has produced significant operating losses for many national companies with large amounts of rate suppression business, has significantly diluted the financial strength of both a sizable number of the weaker national firms, and has produced substantially lower returns for many local firms operating only in rates suppression states as compared with their peers elsewhere.

3. Private Passenger Automobile Insurance

In automobile accident law, victims have traditionally sought compensation for losses through tort liability actions. An owner/operator found to be at fault (or, more recently, more at fault than the victim) was required to pay compensation. Private passenger automobile liability insurance protects the owner against such judgments. Universal availability has been deemed socially necessary; because of the need to provide compensation to victims, yet achieve the economic benefits of automobile activity, purchase of some level of liability insurance has been required of all motorists.

Most observers conclude that U.S. private auto liability insurance markets are competitive. While, as Table 5, Section IV, indicates, the measures of concentration in state-level markets for this line exceed somewhat those of the industry in general, Joskow and McLaughlin (1991), for example, observe that a large proportion of firms operate in all or most states, making the appropriate geographic market national in scope. They further comment that the ease of entry into most additional lines make the relevant product markets the property-liability insurance as a whole. The national Herfindahl-Hirschman Indexes (Table 4, Section IV) shows low concentration for most lines and for the overall industry.

The impact of increasing insurance costs has been particularly severe in private passenger auto insurance as well as workers' compensation insurance. Kramer's (1991b) analysis of the claims cost data leads him to conclude that the rapid growth in bodily injury

liability claim costs, and especially, increases in bodily injury claim frequency, were the principal source of the cost surge. He reports that this is particularly striking given that there has been no comparable increase in the frequency of auto accidents. As was the case with workers' compensation, the surge reflects the rapidly increasing cost of medical care, and particularly in the private passenger auto insurance, the rising use of litigation. Observers report increased tort filings in auto cases, coupled with increasing values for plaintiff injuries. Furthermore, while a much larger number of cases are settled out of court, the sizes of court awards affect the out-of-court settlements.

As was the case for workers' compensation insurance, the concern with affordability induced by the cost trends has produced two divergent regulatory responses. During the two decades following the mid-1960s, nearly half the states adopted some form of competitive rating laws in the hope of containing rising costs. By contrast, by the mid-1970s, several states that maintained prior approval policies had adopted policies of holding down rate increases. These were joined by additional states during the late- 1980s, presumably in response to the cost increases earlier in the decade. Thus, as was true for workers' compensation, claim costs rose more rapidly than premiums over the 1980s. While costs rose by 99 percent, auto insurance premiums rose only by 77 percent.

The residual market shares generally reflect the market dislocations. While the nationwide share of earned premium from vehicles with auto liability insurance in the residual market was relatively constant at 6.1 percent throughout the 1978-87 period, the average residual market share in rate suppression states was 21.5 percent in 1987 (Kramer, 1991b). In earlier examinations of the automobile insurance market, Kunreuther *et al* (1983) and Kopsick (1982) examined the impact of rate suppression, concluding that states with rigid prior approval laws and maximum rates had larger percentages of drivers in these residual markets. Kunreuther *et al* observe, however, that the relation of residual market size and regulatory structure is not perfect, suggesting that other factors are at work in determining the size of the market. More recently, Pauly *et al* (1986) and Grabowski *et al* (1989) have confirmed the earlier results.

Kramer (1991b) has analyzed the impact of rate suppression in private passenger auto liability insurance firms, and finds a strong correlation between the percentage of a firm's business in rate suppression states and lower returns. In addition, firms operating primarily in rate suppression states underperform their peers in other states, although to a lesser extent than workers' compensation firms.

Kramer concludes that current levels of rate suppression do not pose an immediate threat to auto insurance solvency or, by implication, to property-casualty insurance solvency in general. He notes that the poor performance of the property-casualty lines over the past 15 years was not entirely due to rate suppression, although the largest losses were recorded in the rate suppression states. He concludes that "at the margin, current levels of rate suppression will increase the number of insurer insolvencies." Kramer warns that severe rate suppression will ultimately prove incompatible with private insurance markets.

The market for automobile liability insurance may weaken further as state regulators and legislatures continue to limit the ability of insurers to increase premiums. The lead state in this regard is California. In 1988, California voters approved a resolution limiting the ability of firms to deny renewals and mandating a rollback of auto insurance rates to 20 percent below 1987 levels. A number of insurers announced plans to withdraw from the auto insurance markets in those states subsequent to the passage of the legislation. Legislatures have also restricted the ability of companies to use certain variables in classifying risk. In addition, in a number of states, court actions requiring that "rollback" measures provide a fair rate of return, have encouraged the adoption of "fair rate of return" standards, typically applied to monopolistic public utilities, in judging rate applications.

Reforms. The development of substantive reforms in the private passenger automobile insurance system began as early as the 1930s with efforts to address the inability of many victims to obtain sufficient compensation for losses. Kimball (1985) observes that the compensation theme was sufficiently appealing by the 1960s and 1970s to lead to the passage of "no fault" laws, either as add-ons or as partial substitutes for tort law. These laws were intended to provide speedier, more certain compensation at lower cost by reducing the proportion of claims whose resolution required access to the tort liability system.

Two features of current no-fault systems work in tandem to attempt to accomplish this goal (Rand, 1991). The primary feature is the expansion of the level and range of compensation available from first-party insurance (personal injury protection, or PIP) to encompass a large portion of medical and other "economic" losses (but excluding compensation for non-economic, "pain and suffering," losses). This feature provides rapid, more complete, compensation for all victims, reducing the incentive for lawsuits. The second feature is the requirement that a threshold must be exceeded before liability suits may be brought by victims to recover additional damages. This threshold may be either the requirement that victims must have experienced a loss of some specified dollar amount, or that they experienced certain specified medical traumas. The threshold provisions are intended to reduce access to the legal system in the case of lawsuits which involve very minor injuries.

The overall impact of no-fault on insurance premiums is the product of offsetting factors, producing mixed results as a consequence. The limitation of compensation to economic losses tends to lower compensation levels. In addition, by reducing the need for litigation to determine fault and compensation, no-fault plans can reduce the legal expenses share of costs. Both of these factors would lower insurance premiums. However, the first-party insurance provides easier access to the full range of economic benefits which may offset the impetus coming from limiting coverage to economic losses. In addition, if the liability thresholds are set too low, liability suits will not be substantially reduced. Furthermore, the reduction in exposure to the liability system may reduce the incentive to

avoid accidents, so that more accidents may in fact occur, which would also increase costs.[17] In order for no-fault to achieve a cost "balance" or actually to reduce overall costs relative to traditional systems, the potential for increased first-party payments must be matched by reductions in legal and other liability costs.

A number of empirical studies have been made of the various versions of no-fault insurance systems enacted by different states.[18] The largest study to date, that of the Department of Transportation (1985), finds that no-fault has led to reductions in the number of lawsuits and increases in the numbers of victims receiving payments relative to traditional states. However, the most immediate implication of these studies is that the efficacy of no-fault depends critically upon the design features of the individual system.

VI. Conclusions

We can draw the following conclusions from our examination of the property-casualty insurance industry. First, we find the increased regulation of the private automobile liability and workers' compensation insurance to be one of the more troubling trends. While we cannot form conclusions regarding future insolvencies, we do not believe that continued suppression of rate increases relative to claims costs is viable. We believe that the greatest benefit comes from regulatory systems that recognize and attempt to mimic the incentive of the private marketplace. Rather than relying on price controls, which distort the market and create availability problems, it would be far better to directly address the causes of high claim costs. Furthermore, the limitations and costs of price regulation make it an inefficient way to achieve redistributive goals. Decisions to undertake income redistribution goals should not be imposed indirectly, through market regulatory processes, but directly and outside of markets, so that accountability is made clear and private marketplace efficiencies are retained.

With regard to the competitive structure of the industry, our examination leads us to conclude that "natural" anti-competitive behavior is neither sustainable in theory or provable empirically. The great majority of the evidence indicates that firms do not have the power, either individually or collectively, to earn excess profits in these lines, save that derived from state regulation of entry, exit and prices. In their exhaustive examination of the current state of competition and regulation in the industry, Joskow and McLaughlin (1991) speak

[17] There have been several empirical studies of the relationship between no-fault laws and accident rates, including those of Landes (1982), Department of Transportation (1985), Kochanowski and Young (1985), Zador and Lund (1986), Cummins and Weiss (1989a,b,c), and Devlin (1990). No consensus is apparent in this literature.

[18] See, e.g., Rolph, Hammitt and Houchens (1985) and Hammitt and Rolph (1985). Both find evidence of the ability of thresholds to restrict suits.

for most researchers when they state that "Where competitive insurance markets have been allowed to operate, the long-run behavior of insurance prices is consistent with effective competition...Under existing institutional arrangements, the primary constraint on competition is state rate regulation, not monopolistic or collusive behavior that is beyond the reach of the antitrust laws due to the prevailing antitrust exemption...The industry is structured competitively and behaves competitively when it is permitted by state regulators to do so."

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